

**ATTACHMENT #1
RFP B1Z05064**

**MISSOURI SCHOOLS GOING SOLAR
SCHOOL PROFILES
(with color photos and diagrams)**

This document has been compiled to assist offerors in the process of preparing proposals for design and installation of 1-kW photovoltaic arrays on eight K-12 schools. The information in the document was collected and compiled by the Missouri Department of Natural Resources' Energy Center. While significant effort has been made to provide accurate and complete information, this document has been provided as guidance and should not be considered a complete document that contains all information relevant to estimating the costs of a project. Rather, offerors should consider this document as a starting point and make contact with the schools or the permitting authorities listed for clarification of important questions. All schools have indicated a willingness to accept calls and allow offerors to make appointments to visit the school buildings. Also, permitting authorities have indicated a willingness to take calls on this project so please call the appropriate contacts for permitting questions.

If something in this document is unclear, please contact Liz Palazzolo at the Missouri Office of Administration for clarification at (573) 751-4885 or liz.palazzolo@oa.mo.gov. If the issue is technical in nature, the Office of Administration will contact the Energy Center for further clarification.

SHOULD AN OFFEROR DECIDE TO VISIT A SCHOOL BUILDING, PLEASE BE CERTAIN TO CONTACT THE SCHOOL MSGS COORDINATOR IN ADVANCE AND SET AN APPOINTMENT.

DO NOT VISIT SCHOOLS WITHOUT AN APPOINTMENT!

Schools included in this MSGS School Profiles document:

Brittany Woods Middle School (University City)
Brookfield Schools
The College School (Webster Groves)
Compton-Drew Investigative Learning Center (City of St. Louis)
Lewis and Clark Middle School (Jefferson City)
Northeast Middle School (Parkway)
Orchard Farm Middle School
*The Principia (Town and Country)

*Because this school has a religious affiliation, AmerenUE will directly pay for the project costs. While the Energy Center may provide technical assistance, it cannot pass funds for purchase of equipment at religiously affiliated schools.

Missouri Schools Going Solar - School Profile

Brittany Woods Middle School

8125 Groby Road

University City, MO 63130

MSGs Coordinator: Barry Williams, Science Teacher

(314) 290-4280

<http://www.ucityschools.org/schools/brittany.htm>

Permitting Authority:

City of University City

Department of Planning and Development

Contact: Mr. Tom Proemsey (314) 863-32-8 x 235

6801 Delmar Boulevard

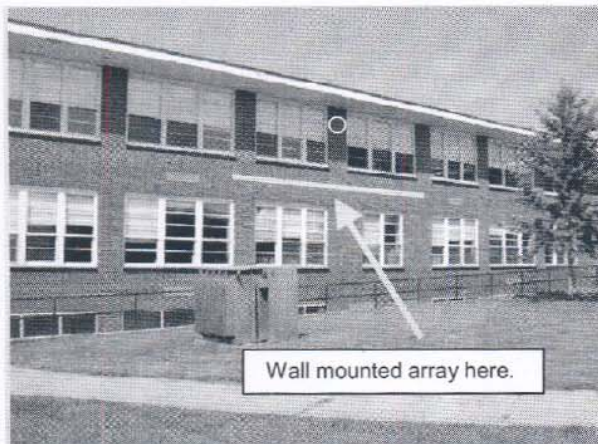
University City, Missouri 63130

(314) 862-0770

<http://www.ucitymo.org/planning/planhome.htm>

Permit Requirements: The Energy Center contacted the City of University City Department of Planning and Development and the permit requirements for this project include application for an electrical permit and a licensed electrician to perform the work. A building permit will likely not be required. The permit fee will likely be minimal and on the order of the fee for a circuit extension. Please contact Tom Proemsey, who is aware of the project, for questions.

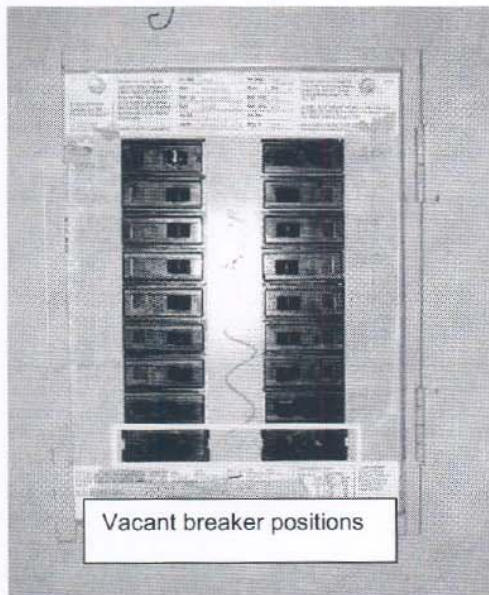
School Building and Proposed Installation Description: Brittany Woods is an older school building of brick exterior and block and plaster interior. The method of installation for this project is an awning style wall-mounted array to be located below the 2nd story windows of Barry Williams' science class. The wall is due-south and an array can be mounted with virtually no shading. The array design should consider the impact on the 1st floor windows as to optimize appropriate solar shading in summer and minimize in winter. See photo of outside of building below.

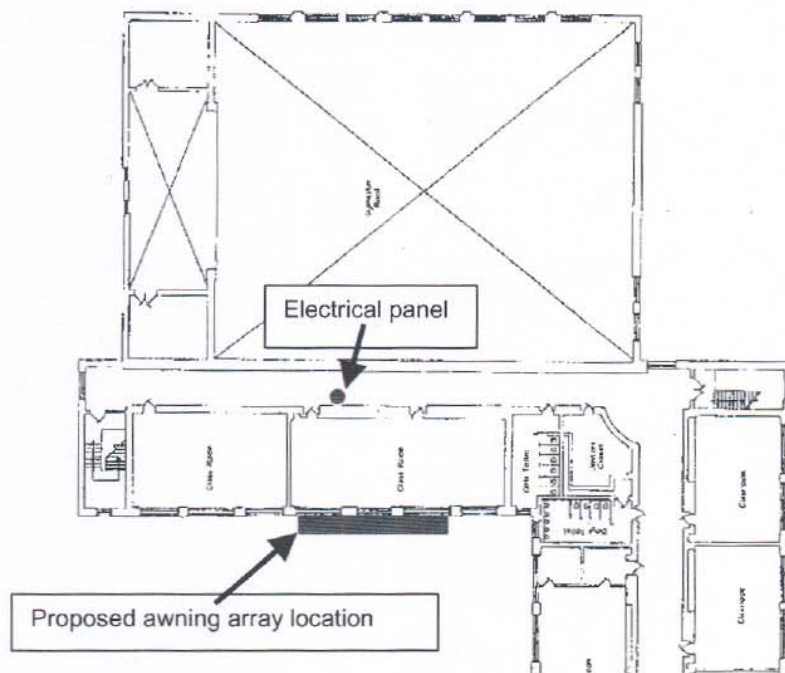


An ideal location for mounting the inverter is up on the wall inside the classroom of Barry Williams. The exterior location is marked on the photo with a red dot and is also shown from an interior perspective in the photo immediately below.



From the inverter location, electrical conduit can easily run above the drop ceiling to the electrical panel located immediately outside the classroom, a distance of **approximately 35 feet**. The panel is marked 208Y 120V. See photo of electrical panel and photo of ceiling above electrical panel.





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Missouri Schools Going Solar - School Profile

Brookfield Schools

Brookfield R-III

124A Pershing Road

Brookfield, MO 64628

MSGs Coordinators: Mickey Beach, Science Coordinator

Holly Caselman, Teacher

(660) 258-7242

<http://www.brookfield.k12.mo.us/>

Permitting Authority:

City of Brookfield, Code Enforcement

Contact Name: Greg Williams

116 W. Brooks

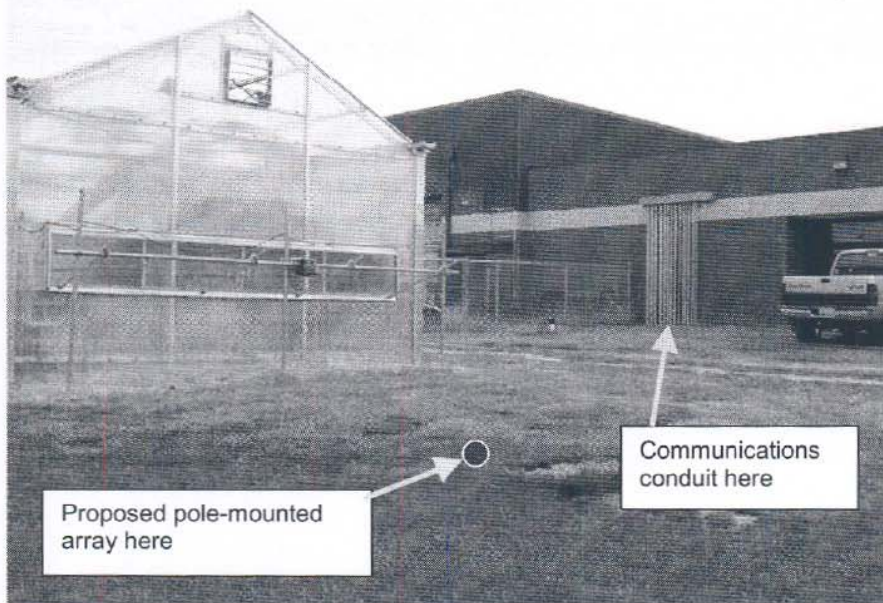
Brookfield, MO 64628

(660) 258-5300

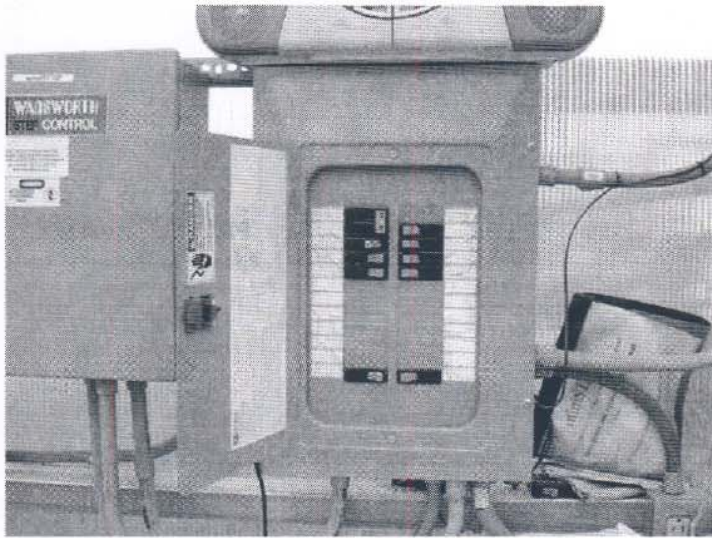
Permit Requirements: The Energy Center has contacted Greg Williams of the City of Brookfield and the requirements include that the contractor have an electrical license in the City of Brookfield and that the interconnection requirements of AmerenUE should be sufficient to meet the City's requirements. Please contact Greg Williams to coordinate and ask questions.

School Building and Proposed Installation Description: Brookfield Schools has several schools located on one large campus. The proposed installation for this school is a low accessible pole mount so that the array can be easily viewed. The array will be located just south of the green house. The proposed grid-tie connection is to the subpanel located inside the greenhouse that is served by two 120-volt circuits from a panel inside the shop. The service panel in the shop labeled "Panel P6" is 208Y/120 volt service. The distance from array location

to the greenhouse subpanel would be approximately 60 feet max. If for some reason it is required to tie into Panel P6, an additional 150 feet of conductor will be required. Communication conduits are located 50 feet east of the greenhouse on the west wall of the main building.



Missouri Schools Going Solar - School Profile



← The electrical panel inside the greenhouse.

Brookfield Schools is also interested in the possibility of installing a stand-alone photovoltaic system to the Interpretive Nature Center amphitheater. Loads have not been determined but may include minimal lighting, sound equipment and occasional plug loads such as audio-visual equipment. The picture shown is looking north. Offerors are encouraged to include an alternate proposal for design and installation of an appropriate stand-alone system for the school to consider.



The site plan is shown on the following page.

Map of the University of Maryland Eastern Shore campus showing buildings and landmarks:

- Elementary School
- Middle School
- High School
- AREA Center
- Outdoor amphitheater
- Pole-mounted area in this area
- Greenhouse
- Interpretive Trail
- Pond Area

Outdoor amphitheater

Missouri Schools Going Solar - School Profile

The College School

One Newport Place

Webster Groves, MO 63119

MSGs Coordinators: Matt Diller, 3rd grade teacher

(314) 962-9355 Need Distances

<http://www.thecollegeschool.org/>

Permitting Authority:

City of Webster Groves Department of Planning and Development

Contact: Mike Harney, Building Commissioner (314) 963-5317

#4 E. Lockwood

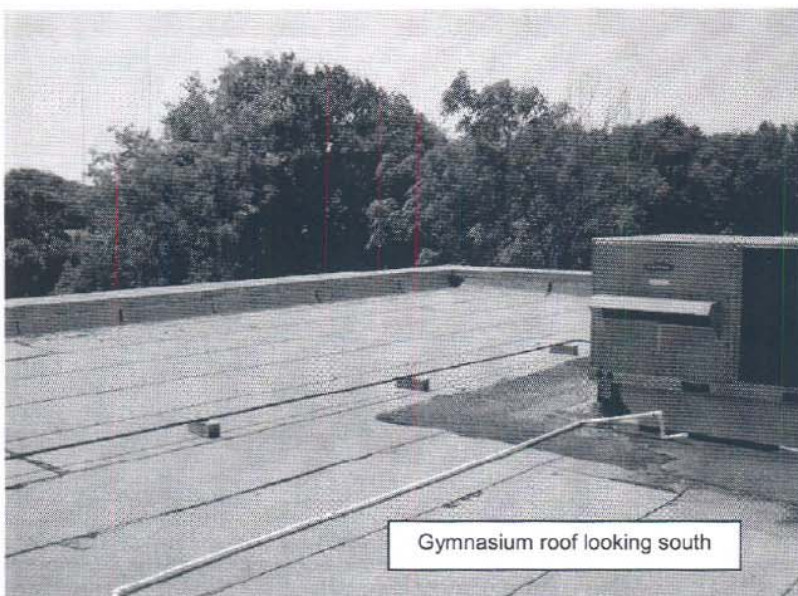
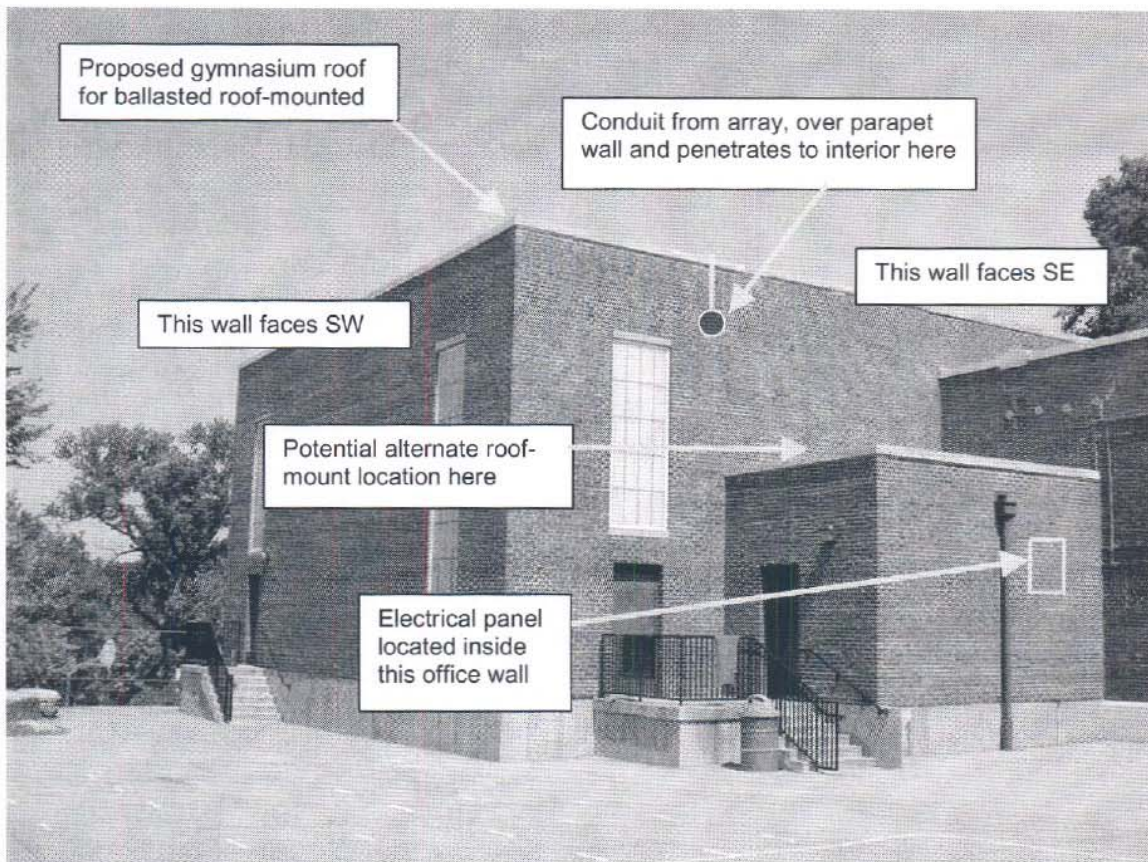
Webster Groves, MO 63119

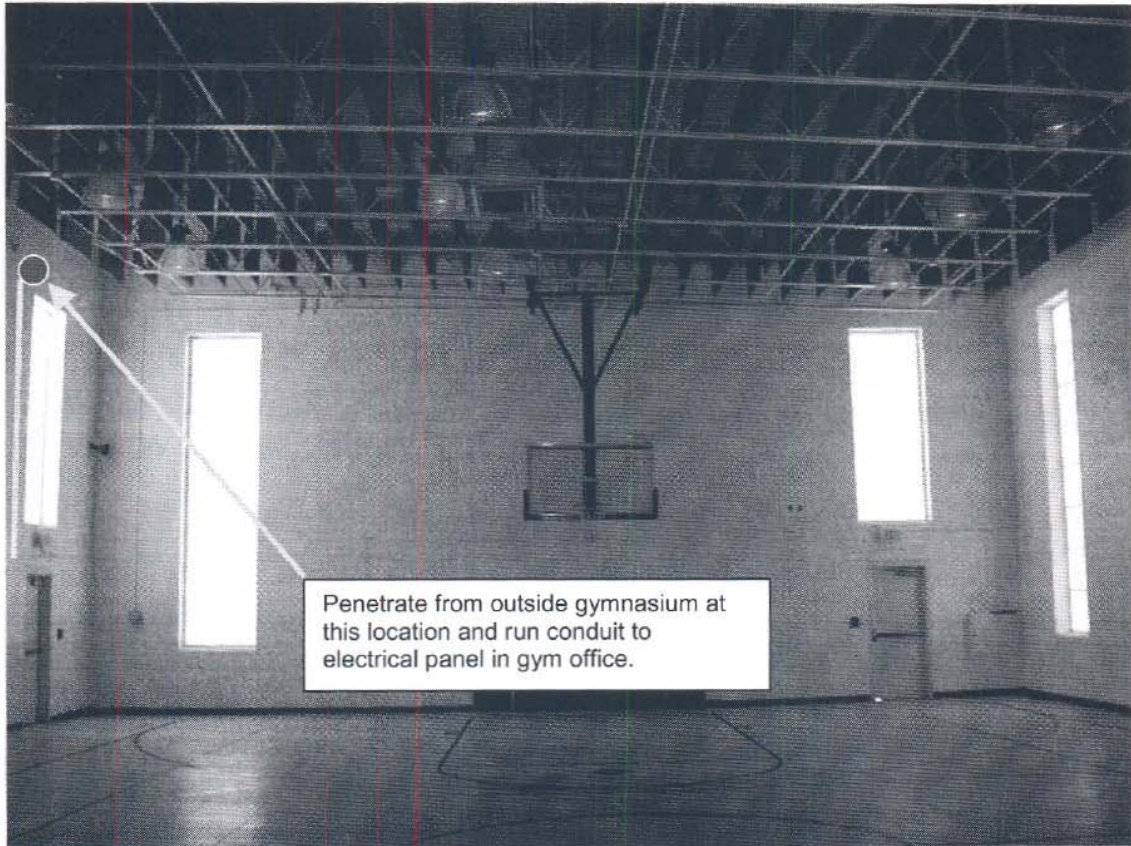
(314) 963-5300

<http://mo-webstergroves.civicplus.com/index.asp?SID=364>

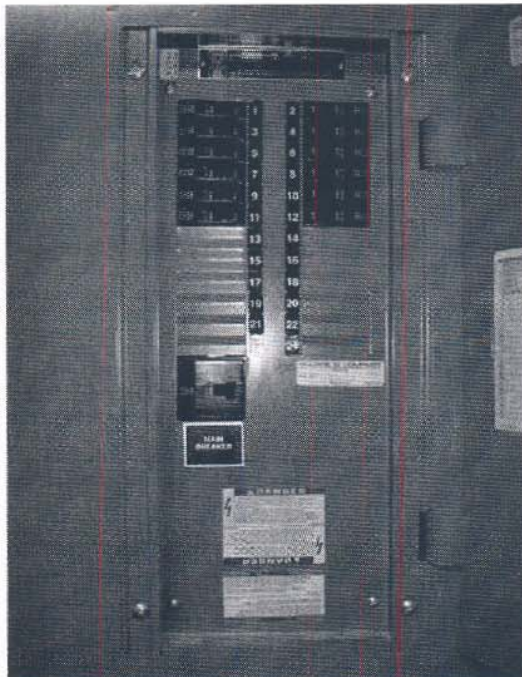
Permit Requirements: The Energy Center has contacted the City of Webster Groves Department of Planning and Development and the requirements for permitting at this site include application for a building permit, electrical permit, and roof loading calculations. The cost of a building permit is based upon the value of the construction project and the number of inspections required. The application fee is \$25. The permit cost is \$12 for the first \$1,000 and \$4 per \$1,000 of project value thereafter, and inspections are \$25 each. It is recommended that offerors contact Mike Harney who is aware of this project and can answer questions related to permitting.

School Building and Proposed Installation Description: The College School is a unique school housed in an older school building with a newer gymnasium addition. The proposed installation type is a ballasted roof-mount on top of the gymnasium roof. There is access to the roof through a restroom on the second floor. The gymnasium has parapet walls that extend approximately 18" above the roof that would block the view of the panels from the ground. If possible, the ballasted roof mount structure should raise the panels high enough to be seen from a location on the school grounds such that students can view at least a portion of the array from the ground. The distance from the roof site to the electrical panel is less than 65'. **Alternatively, it may be possible to locate the array on a lower roof above the gym office roof.** The inverter could be mounted inside the gymnasium or on the array mounting framework. See the photos below.





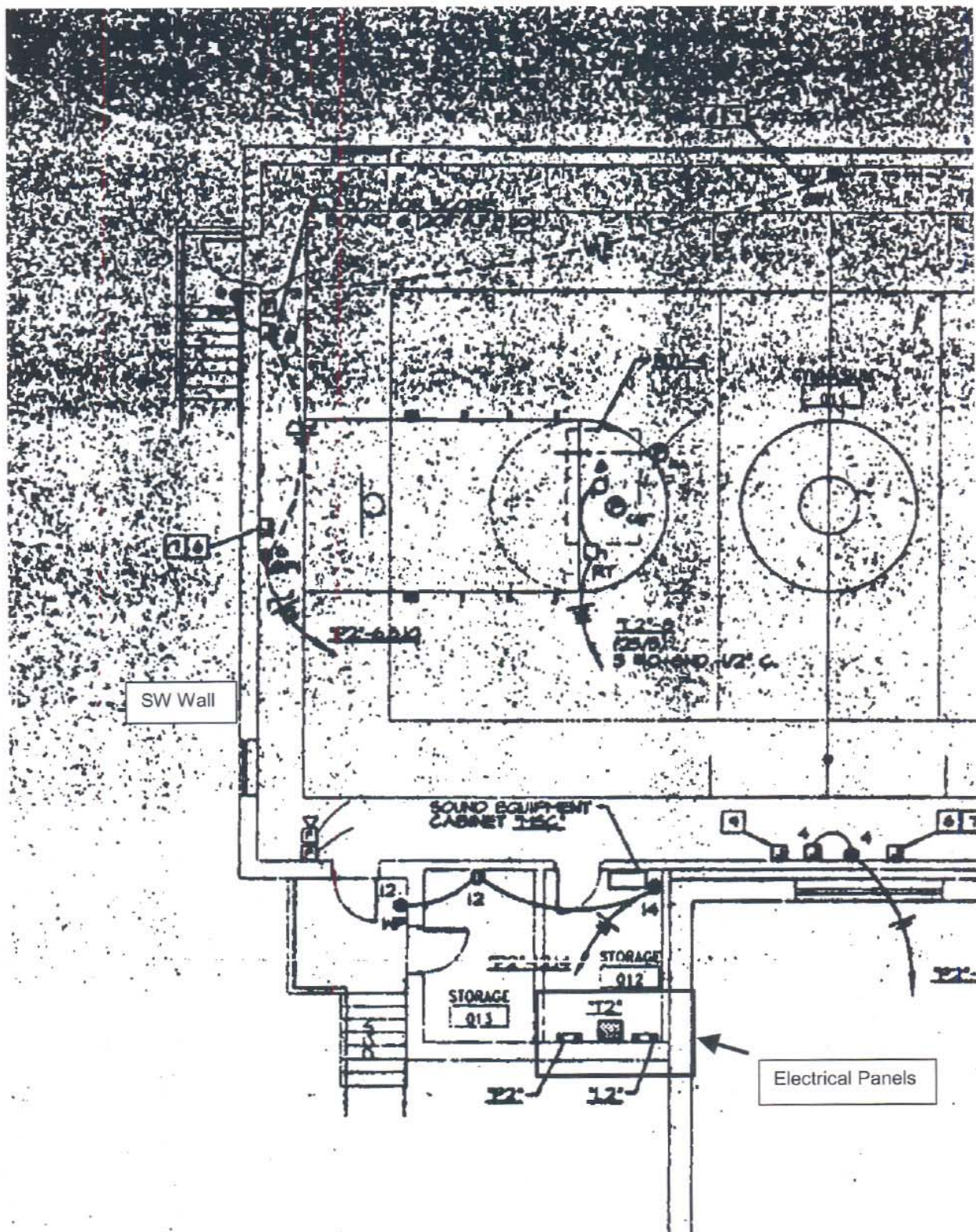
Penetrate from outside gymnasium at this location and run conduit to electrical panel in gym office.



The electrical panel has vacant breaker positions for 208Y /120V and is a Square D panel.

Two electrical drawings that were available are shown below.

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Missouri Schools Going Solar - School Profile

St. Louis Compton-Drew Middle School

5130 Oakland Ave.

St. Louis, MO 63110

MSGs Coordinator: Freda Hill, Science Teacher Lead

(314) 560-1743

http://www.slps.org/Schools/middle_2.htm

Permitting Authority:

City of St. Louis

Building Division - Electrical Section

Contact: John Stacy, Chief Electrical Inspector (314) 622-3325

Room 425, City Hall

1200 Market Street

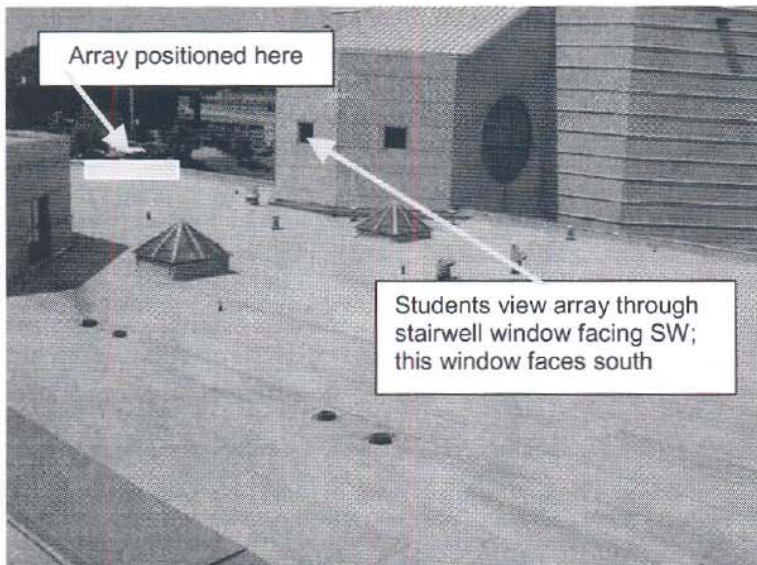
St. Louis, MO 63103

Phone: (314) 622-3325

<http://stlouis.missouri.org/government/building.html>

Permit Requirements: The Energy Center has contacted the City of St. Louis Building Division Electrical Department and the requirements for permitting at this site are the following include a licensed contractor performing the work as well as electrical and building permits. Roof load calculations will likely be required. It is recommended that offerors contact John Stacy, the city's Chief Electrical Inspector, who is very interested in this project and solar technology in general and may be able to advocate for this project.

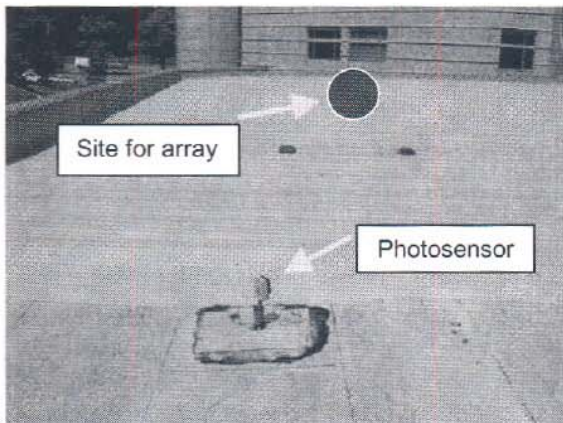
School Building and Proposed Installation Description: The Compton-Drew Investigative Learning Center is a relatively new magnet middle school having focus in science.



The proposed installation method is a ballasted roof-mounted array that would be positioned such that students could view the array through stairwell windows.

⇐ See the photo to the left. The inverter would be mounted to the array framework and A/C wiring would be run through the roof and into the electrical panel. There exists a conduit for a photosensor as shown in the photos below.

Missouri Schools Going Solar - School Profile



⇐ Location of conduit for photosensor and site for the array. This conduit may provide room for wiring

A view of the ceiling in the electrical room showing the conduit from the photosensor. ↓



The distance from the proposed array location to the electrical panel is approximately 90'.



⇐ The electrical voltage appears to be 208Y/120V **but must be verified by the school**. There are plenty of vacant breaker positions.

No site or electrical drawings were available at the time this document was created. The Energy Center has requested the drawings.

Missouri Schools Going Solar – School Profile

Lewis and Clark Middle School

Jefferson City School District

325 Lewis & Clark Drive

Jefferson City, MO 65101

MSGs Coordinators: Bob Steffes, Principal

Barb Kuebler, Teacher

(573) 659-3200

<http://www.jcps.k12.mo.us/ms/lc/titlepage.htm>

Permitting Authority:

Jefferson City Community Development

Building Regulations Division

Contact: Bill Stockman, (573) 634-6414

320 East McCarty Street

Jefferson City, MO 65101

Phone: (573) 634-6410

<http://www.jeffcitymo.org>

Permit Requirements: The Energy Center has contacted the Jefferson City Community Development Building Regulations Department and the requirements for permitting at this site include a licensed contractor performing the work as well as an electrical and possibly a building permit. Roof load calculations will likely be required. It is recommended that offerors contact Bill Stockman, an electrical inspector, who is aware of this project and may be helpful in answering questions.

School Building and Proposed Installation Description: Lewis and Clark Middle is a relatively new school. The proposed installation is a ballasted roof mount to be angled as needed to face south. The wall in attached picture is facing southwest. Service panel (PNL IPL14) with **208Y/120** voltage is located in room directly below roof and has vacant breaker positions. (See diagram of electrical wiring shown below). A side wall penetration would be required with an approximately 30-foot cable and conduit run. The inverter would be located inside the building near the electrical panel.

PANEL 1PL14

MLO

DIRECTORY

LOAD

CIR. NO.

BKR.

BKR.

CIR. NO.

LOAD

DIRECTORY

RECEPTACLES

1200

1

2

750 RECEPTACLES

RECEPTACLES

1050

3

4

750 RECEPTACLES

RECEPTACLES

1050

5

6

1050 RECEPTACLES

RECEPTACLES

1050

7

8

1050 RECEPTACLES

SPARE

500

9

10

900 RECEPTACLES

SPARE

500

11

12

500 SPARE

SPARE

500

13

14

500 SPARE

SPARE

500

15

16

500 SPARE

SPACE

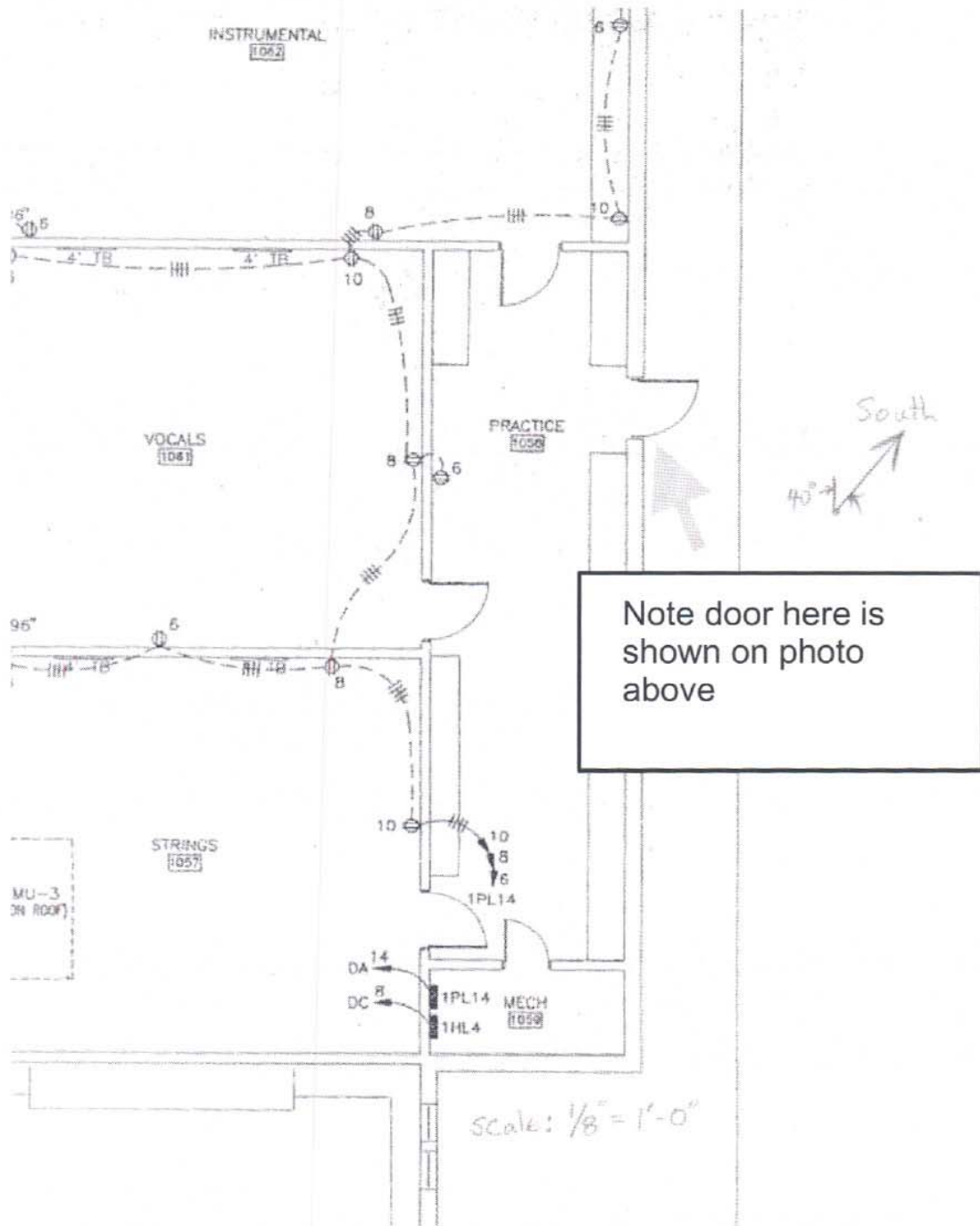
17

18

SPACE

120/208V. 3 PHASE 4 WIRE SN
1P-20A BKRS. EXCEPT AS NOTED

Missouri Schools Going Solar – School Profile



Missouri Schools Going Solar - School Profile

Parkway Northeast Middle School

181 Coeur DeVille Dr. (NW corner I-270 & Ladue Road)

Creve Coeur, MO 63141

MSGGS Coordinator: Bill Guinther, Resource Conservation Manager

(314) 415-8278

<http://www.pkwy.k12.mo.us/schools/schoolportal.cfm?SchoolID=20>

Permitting Authority:

For Building:

City of Creve Coeur Building Division

Contact: Steve Hiser, Building Division Manager (314) 872-2513

300 N. New Ballas Rd

Creve Coeur, MO 63141

(314) 872-2500

<http://www.creve-coeur.org/Com-Dev/building.htm>

For Electrical:

St. Louis County Department of Public Works

Building Permits

Contact: Marcellus Speight (314) 615-7162

41 South Central Avenue, 6th Floor

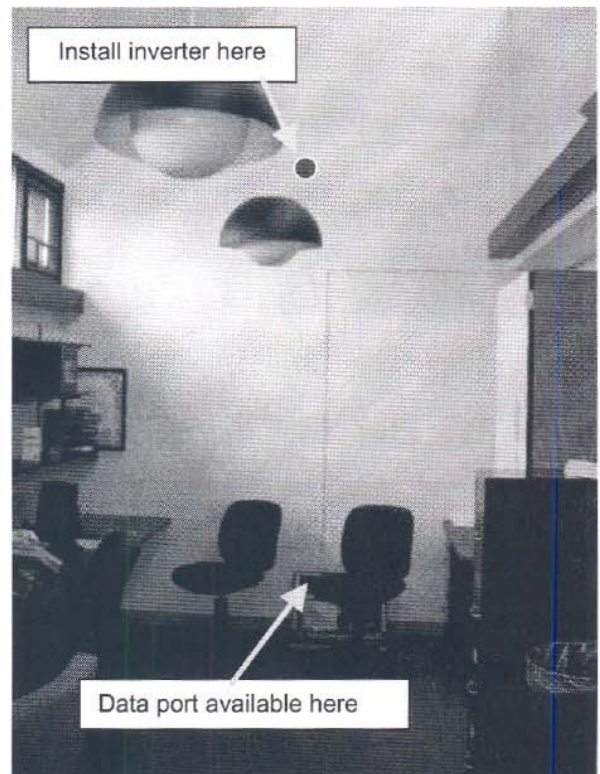
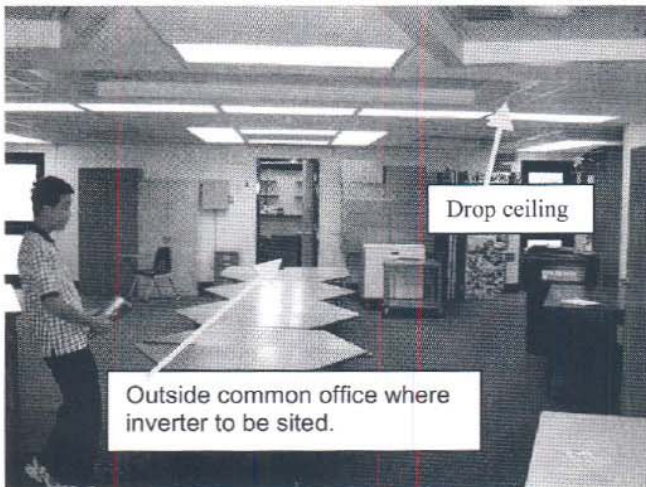
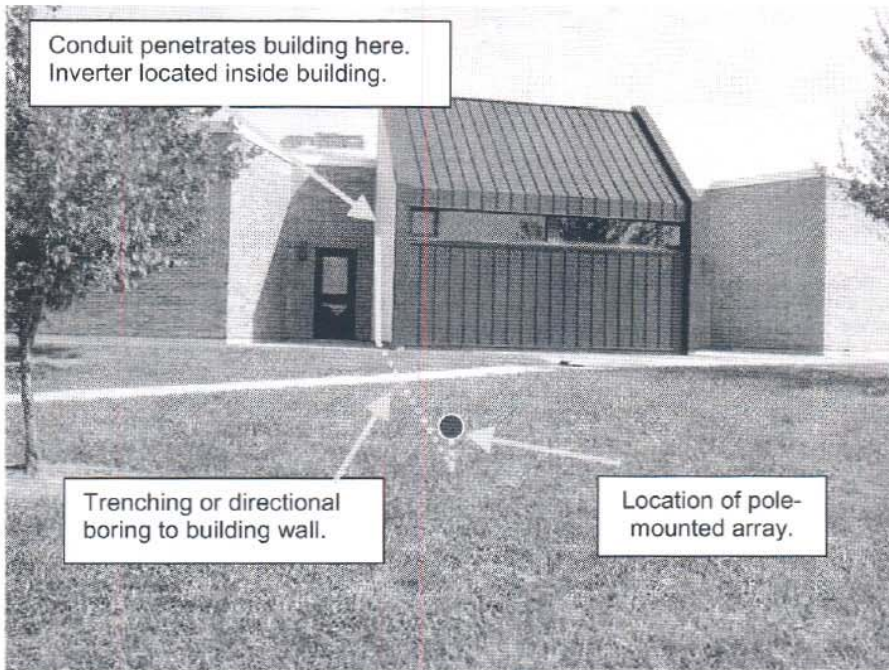
Clayton, MO 63105

(314) 615-5184

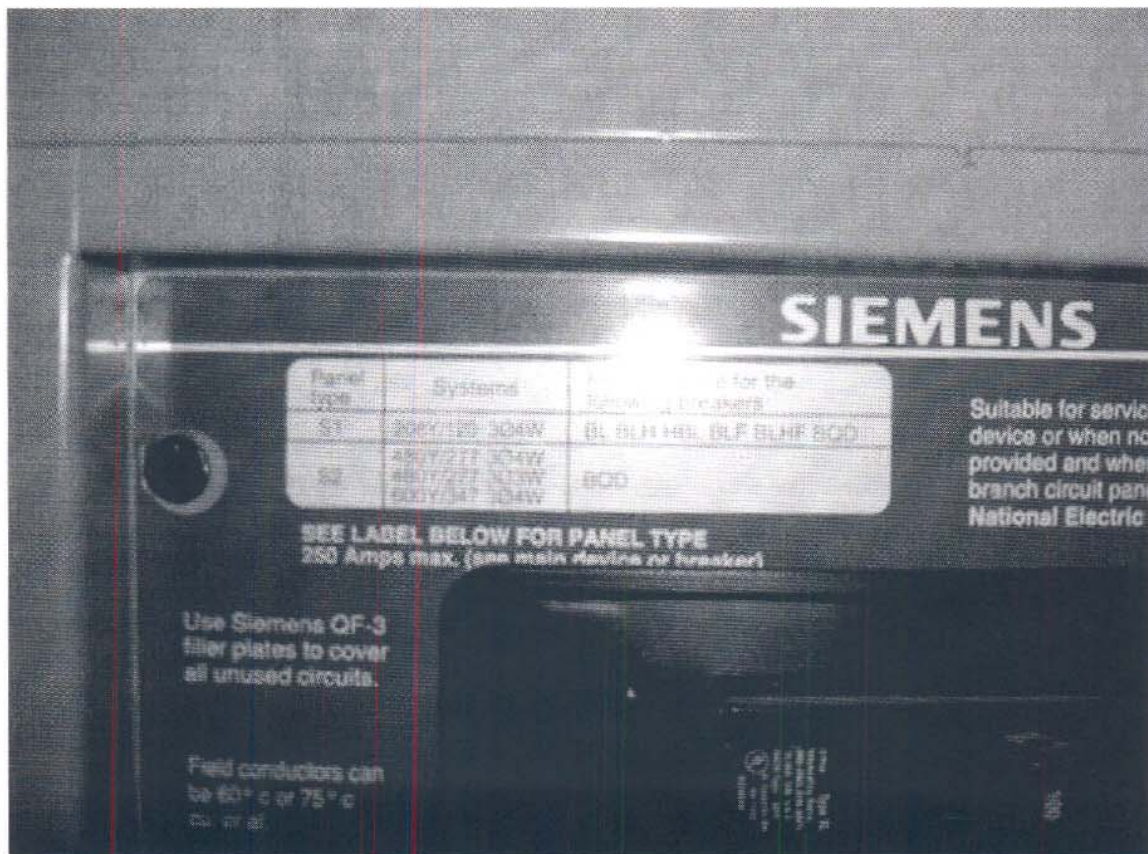
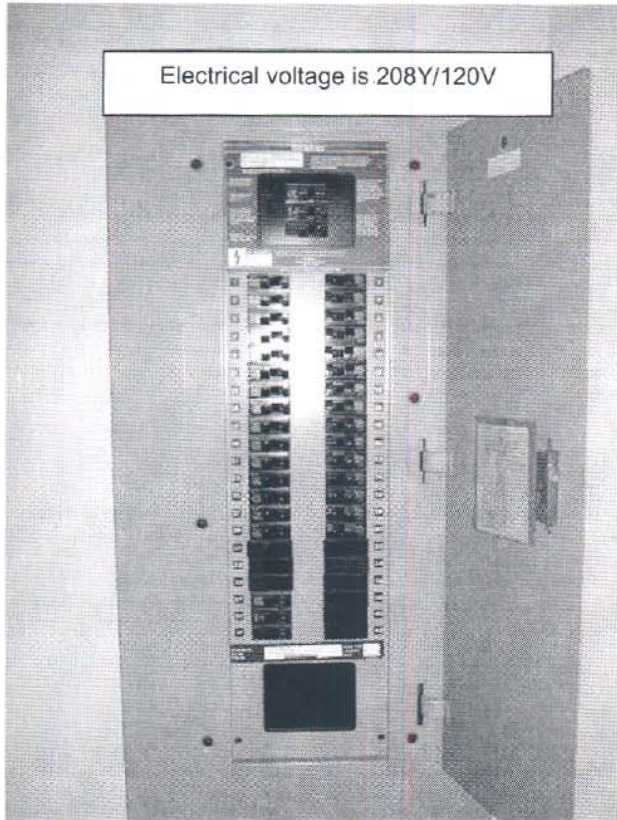
<http://www.stlouisco.com/pubworks/Index.html>

Permit Requirements: The Energy Center has contacted the City of Creve Coeur Building Division and the requirements for permitting at this site include a building permit application with 3 sets of drawings showing pier and pole mount details and sealed by a MO registered engineer, and calculations on wind load for 70 mph winds. Fees are \$20 up-front and then \$4 for each \$1000 of project cost or \$50, whichever is higher. The Energy Center also contacted the St. Louis County Department of Public Works and the requirements are to apply for an electrical permit and for a licensed electrical contract to perform the work. Plans are not required. The county will issue a permit number that can be used to set up an inspection by the computerized telephone system. Fees for electrical permits in the county vary based on the amount of work to be done rather than cost, but should be less than \$50. Offerors may request a fee sheet from the county (it is not available online). For electrical permitting questions, contact Marcellus Speight who is aware of this project.

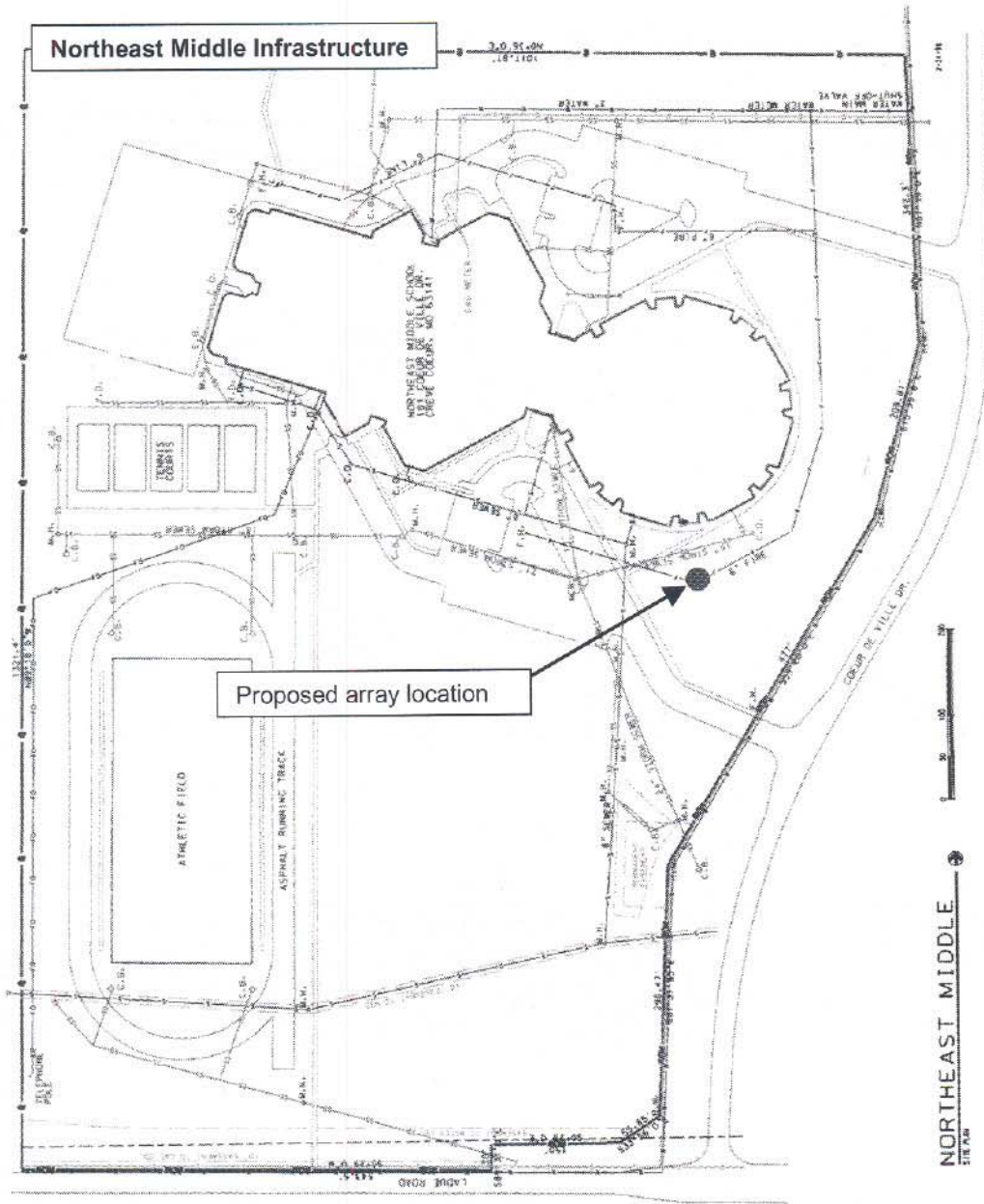
School Building and Installation Description: Northeast Middle School is a single-story brick structure. The proposed pole-mounted array will stand prominently on the southeast section of the property and be visible to approaching visitors. The power from the array will run through underground conduit, below the sidewalks and return up the side of the building where it will penetrate the building into a common area office inside. From the inverter, the A/C power will enter the ceiling and proceed over a hall and classroom approximately 80' to the electrical panel. In this common office there is also a data port that will easily allow connection of the data acquisition system to the school's computer network. See the series of photos above and below.



Electrical voltage is 208Y/120V

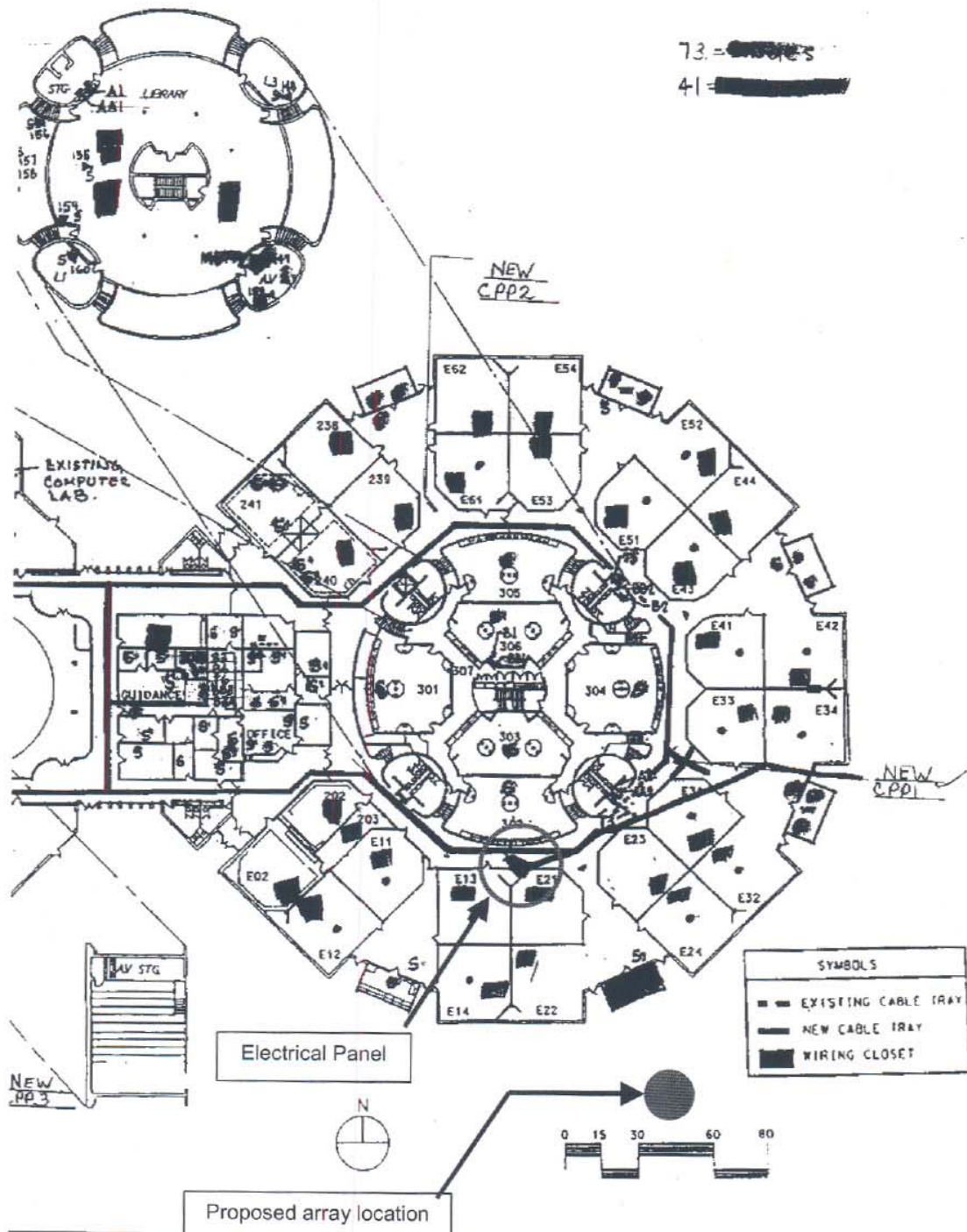


Missouri Schools Going Solar - School Profile



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Missouri Schools Going Solar - School Profiles

Orchard Farm Middle School

2165 Hwy Y

St. Charles, MO 63301

MSGGS Coordinators: Josh Wilmsmeyer & Leah Kuehnel

(636) 250-5300

<http://www.ofsd.k12.mo.us/>

Permitting Authority:

St. Charles County Government
Community Development - Building

Contact: Dave Mulcahy

201 N. 1st Street

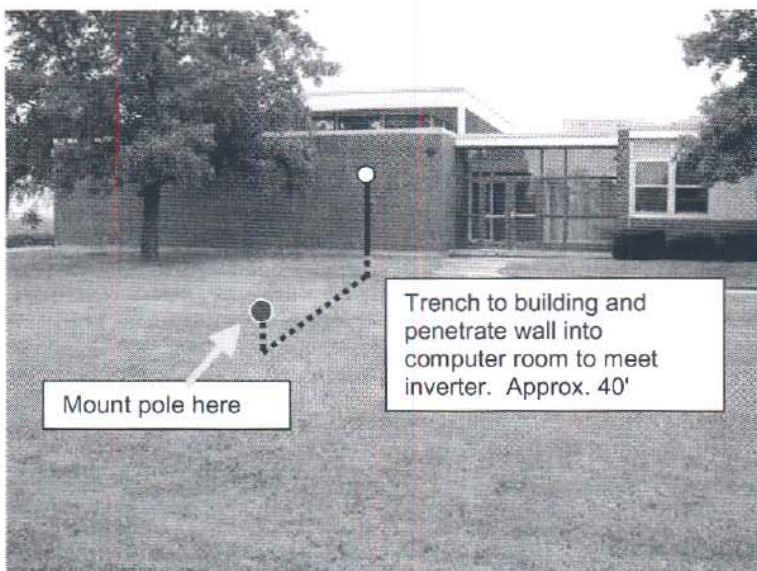
St. Charles, MO 63301

(636) 949-7345

<http://www.saintcharlescounty.org/DesktopDefault.aspx?tabid=247>

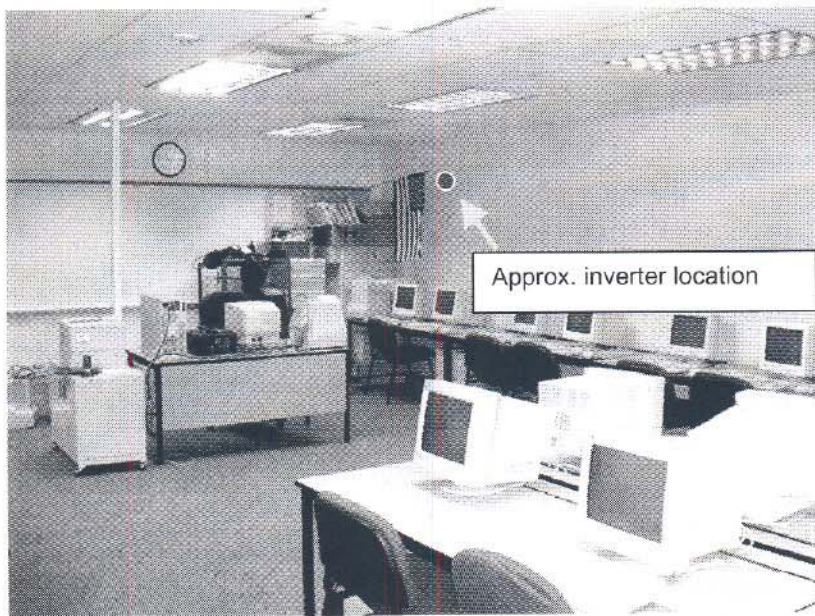
Permit Requirements: The Energy Center has contacted the St. Charles County Community Development Office and the requirements for permitting at this site include a licensed contractor to perform the work, 2 sets of plans sealed by a MO registered engineer, load calculations for 70 mph wind loads, and a site plan to show where the array will be located. There will be zero fee for permitting since this is a not-for-profit institution. The Energy Center is currently pursuing getting that permit fee waiver from St. Charles County. It is recommended that offerors contact Dave Mulcahy who is aware of this project and can answer any questions.

School Building and Proposed Installation Description: Orchard Farm Middle School is a rural school located in the northern portion of St. Charles County. This school has a very active teaching and maintenance staff that is very motivated to assist with this project. **In fact, the school has agreed to run the electrical line from the school's electrical panel to the inverter location and allow the solar contractor to perform final connections.** This system will be a pole-mounted array with trenching to the building. There is no sidewalk between the proposed

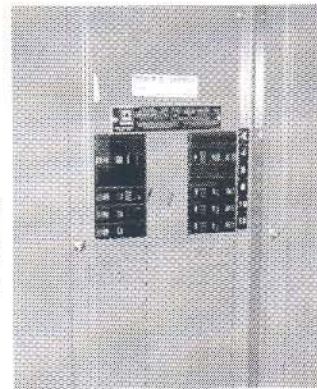


pole location and the nearby wall as shown in the photo. The inverter is to be mounted in the computer room immediately opposite the penetration shown in the photo at left. See the computer room photo for approximate inverter mounting location. The distance from the proposed pole location is 40' from the exterior wall. Again, the school has agreed to run the wire and conduit from the

inverter to the school's electrical panel once they are told what size wire and conduit to use.



<=Inside the computer room, the inverter will be mounted high on the wall above the computers as shown below. The distance from the inverter to the electrical panel is approximately 70'.



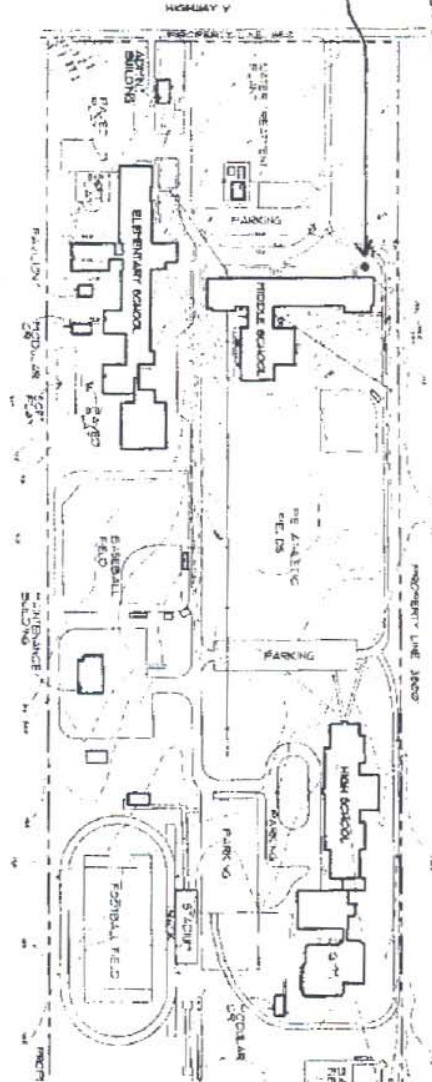
The electrical panel is Square D and is marked 208Y 120V. => There are plenty of vacant breaker positions.

Site and building plans are shown on the following page.

SITE PLAN

South

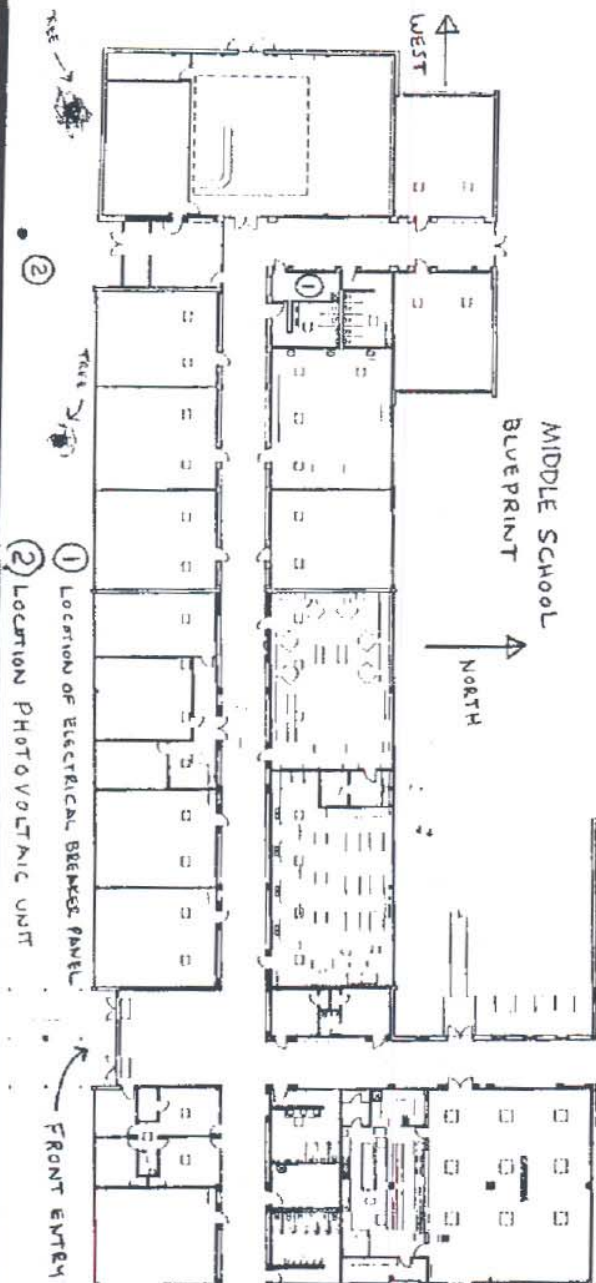
Proposed location of
pole mounted
photovoltaic
array unit



MIDDLE SCHOOL BLUEPRINT

North

West



- ① LOCATION OF ELECTRICAL BREAKER PANEL
- ② LOCATION PHOTOVOLTAIC UNIT

Missouri Schools Going Solar - School Profile

The Principia

13201 Clayton Road

Town and Country, MO 63131

MSGSG Coordinators: Raymond Popp, Director of Facilities

(314) 514-3168 (Ray)

Paul Fletcher-McGookin, 5th grade teacher

(314) 275-3016 (Paul)

<http://www.prin.edu>

Permitting Authority:

For Buildings:

City of Town and Country

Bob Bodley, Chief Building Inspector

1011 Municipal Center Dr.

Town & Country, MO 63131-1101

(314) 432-8075

<http://www.town-and-country.org/planning.cfm#3>

For Electrical:

St. Louis County Department of Public Works

Building Permits

Contact: Marcellus Speight (314) 615-7162

41 South Central Avenue, 6th Floor

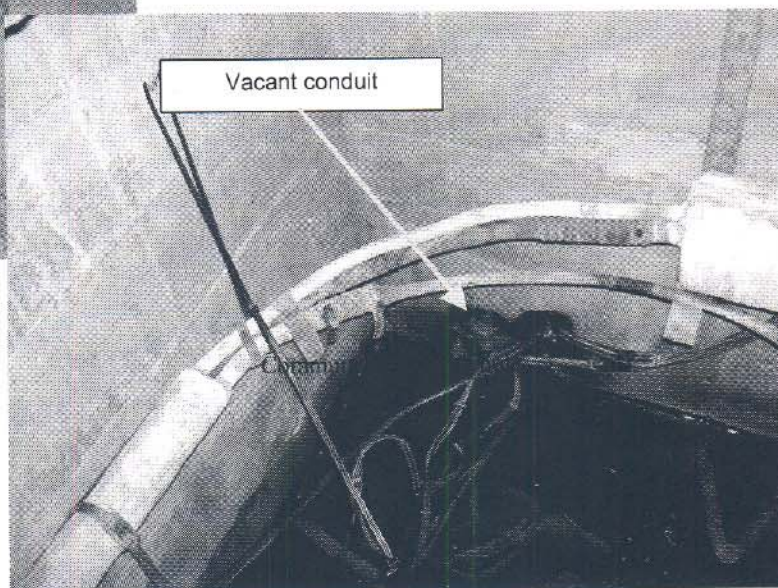
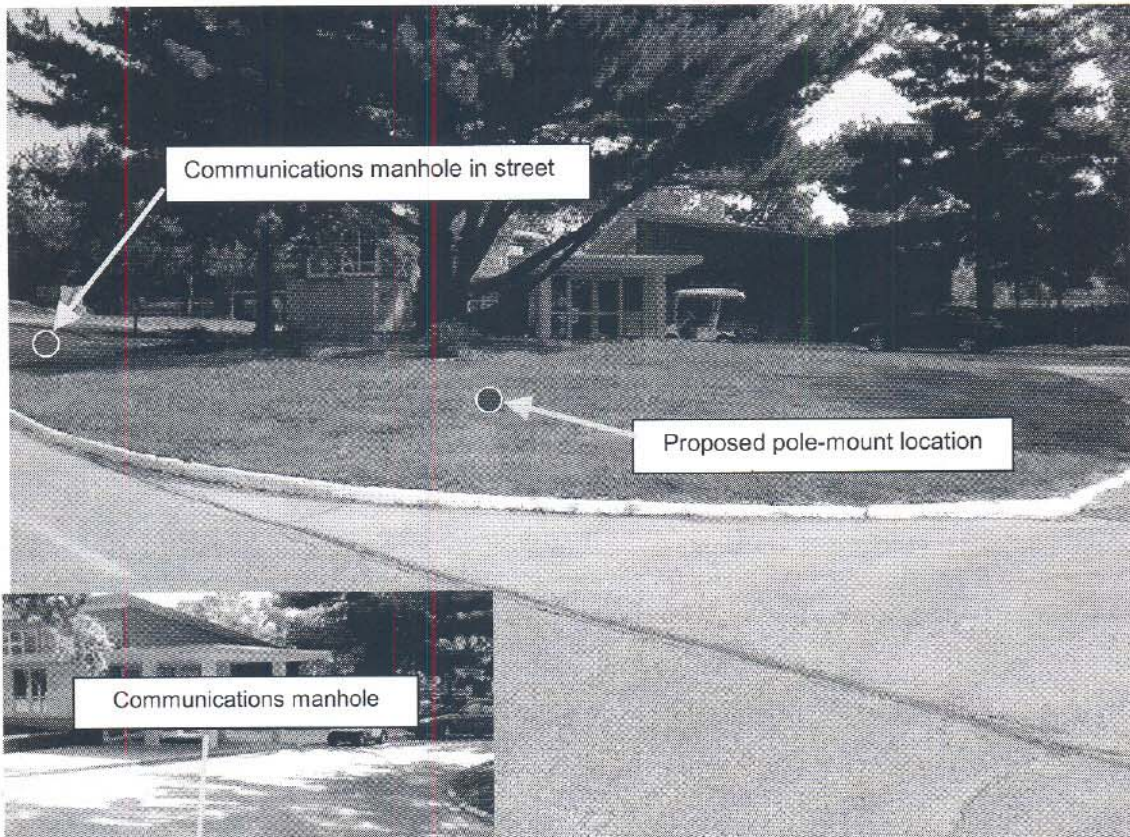
Clayton, MO 63105

(314) 615-5184

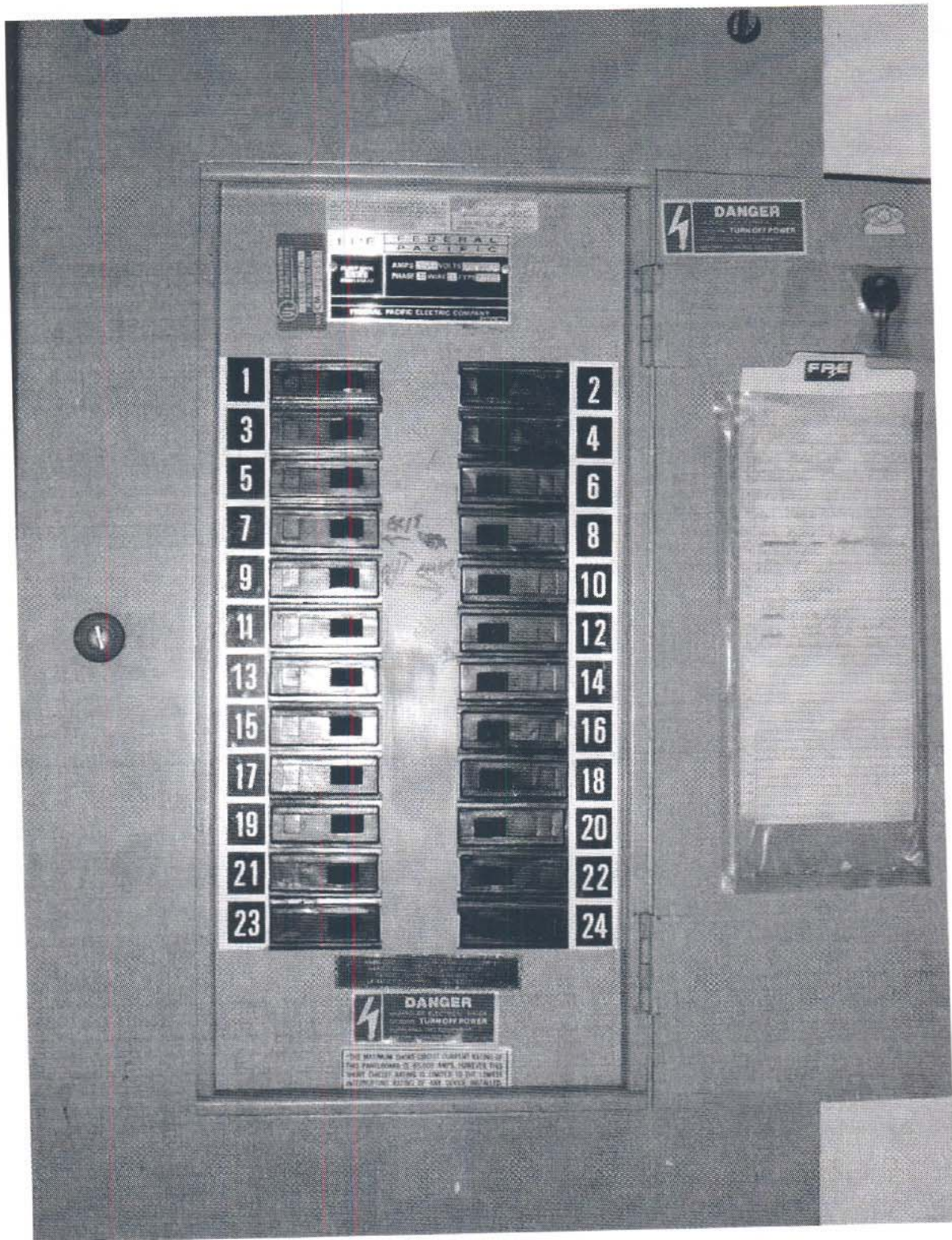
<http://www.stlouisco.com/pubworks/Index.html>

Permit Requirements: The Energy Center has contacted the City of Town and Country and the requirements for a permit are to apply for a building permit and to contact Mr. Bob Bodley. It seems that the city may waive the fee for the project at The Principia since it is an educational project. The Energy Center also contacted the St. Louis County Department of Public Works and the requirements are to apply for an electrical permit and for a licensed electrical contract to perform the work. Plans are not required. The county will issue a permit number that can be used to set up an inspection by the computerized telephone system. Fees for electrical permits in the county vary based on the amount of work to be done rather than cost, but should be less than \$50. Offerors can request a fee sheet from the county (it is not available online). For electrical permitting questions, contact Marcellus Speight who is aware of this project.

School Building and Proposed Installation Description: The Principia has a large K-12 campus that includes lower, middle and upper schools. The proposed installation is a pole-mounted array located prominently in front of the lower school. The inverter will likely be mounted outside on the array framework due to the distance to the proposed electrical panel. Trenching or directional boring to a communications manhole located approximately 65' northeast of the proposed array site. **Note that to get there will require crossing over or under a high voltage 4160 volt underground supply line.** From inside this manhole, an existing large (1"+) vacant conduit is available that connects the manhole to the boiler room, approximately 150' away. Inside the boiler room there is an electrical panel. See the photos below.



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